January 25, 2013

Testimony to: Osage Negotiated Rulemaking Committee, Designated Federal Officer for the Commission is Eddie Streater, Acting Deputy Regional Director - Trust Services, Eastern Oklahoma Region, Bureau of Indian Affairs, 3100 W. Peak Blvd., Muskogee, OK 74401

From: Thomas E. Williams, Sr. Advisor to the Environmentally Friendly Drilling Project, 510 Asbury Street, Houston, TX 77007. 713 201 3866.

Thank you for this opportunity to provide recommendations to the rulemaking committee. I made a presentation to the Director and representatives from the BIA and the Osage Mineral Council on January 17, 2013 at the Osage Casino in Tulsa, OK. The presentation was based on my findings from a study conducted at the request of The Nature Conservancy (TNC). The study was initiated in July 2012.

I am on the management team of a non-for-profit consortium called the Environmentally Friendly Drilling Program (EFD). Background information on this program and the experience of the management team is shown in *Attachment 1* of this document.

I recommend to TNC and some of the larger landowners in Osage County they cooperate in addressing some of the poor operator practices and the lack of regulatory oversight concerning oil and gas operations, water protection, gas venting and in particular H2S. My report states that I am very concerned there is a good chance a catastrophic event will happen on Osage County soon and someone will be injured or killed from a well control blowout, fire or a H2S incident. This is avoidable and I as have told landowners and BIA, there are some near term things the regulators can and should do to prevent this. In the longer term the cause of this situation and other serious issues of safety and environmental protection should be addressed in this CFR revision process.

The purpose of this written testimony is to specifically address a process for changes in the 25 CFR 226.

The current regulations are outdated, they have not kept up with current best practices, today's industry standards, commonly used technology and are therefore inadequate. The regulatory *process* in Osage is also in shambles and because of inadequate resources and poor regulations, it needs to be changed and these process changes should be addressed in the CRF revisions. In my opinion it would be very difficult if not impractical to just "red-line" the inadequate CFR 226 sections as the entire section should be re-written. The good news for the Rulemaking Committee is there are plenty of models already developed. There have been recent major revisions to several state oil and gas regulations and practices. The BLM has gone through a regulatory review process. There are objective experts like the EFD team and others who can help in the process to make these revisions. If properly revised, the Osage will see improved safety, better environmental protection and an increase in oil and gas production by applying the latest practices and encouraging more competent and prudent operators to properly develop the Mississippi Lime and other promising new and mature plays.

Ideally the Interstate Oil and Gas Compact Commission (IOGCC) sponsored organization called State Review of Oil and Natural Gas Environmental Regulations (STRONGER) who regularly reviews and audits state regulations should to do this for Osage County. In 1999, with the IOGCC support - STRONGER was formed to manage the state review process. STRONGER received funding from EPA, DOE and API. The 1994 Guidelines were revised in 2000, 2005 and 2010. Important additions were Spill Prevention, Performance Measures (to evaluate how well state programs achieve their goals), Stormwater Management, and Hydraulic Fracturing.

There are other models and tools as well:

- The EFD program has developed a Scorecard which is a tool to objectively assess oil and gas environmental drilling and completion performance. While it does not get into many of the regulators issues that must be revised in the Osage CFR, it is a tool which can assist in the process.
- There is a January, 2013 DNV Recommended Practice DNV-RP-U301 "Risk Management of Shale Gas Development and Operations." This is an excellent tool for helping in this process. It contains well written guidelines to protect safety of people and the environment. While specifically addressing shale plays, it has application to all oil and gas operations.
- The Ground Water Protection Council has developed guidelines for assuring wells are designed and constructed to prevent water pollution. A 2009 report addresses permits, well construction, hydraulic fracturing and spills; it was funded by the Department of Energy, NETL DE-FC26-04NT15455.
- The States of Colorado and Ohio have recently made significant regulatory revisions, the new regulations and the process is available on their website. Other States like Texas and Oklahoma are good models for proper regulations.
- Most states are now revising their regulations to require operators participate in FracFocus. This is a web based registry developed by the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission. (Both are located on Oklahoma). It was developed to provide transparency, protect groundwater, engage the public, the hydraulic fracturing process is explained process and it provides well information. Osage should also require reporting to FracFocus.
- The American Petroleum Institute (API) Recommended Practices are cited in all State oil and gas regulations for well drilling completing and most activities around well construction and cementing. API RPs should be incorporated into your process.
- The BLM has a list of Best Management Practices (BMPs) and our EFD program has also sponsored a free well-used BMP website developed by the Colorado School of Law. They are experts in the regulatory process.
- The Environmental Defense Fund (EDF) has developed a Model Regulatory Framework" (MRF) to serve as a road map for upgrades to regulatory standards for well construction and integrity testing. The model covers permits/plans, regulatory authority/responsibility, well control, well construction, completion through plugging and abandonment. The EDF would be interested in

providing the Osage committee with documents for modernizing wellbore integrity rules as shown in *Attachment 2*.

In conducting my study I visited several oil and new well sites in Osage County. I met with landowners, the BIA, operators, service providers, Oklahoma State officials, the EPA, water and sour gas experts, experts who have been involved in mitigating damages caused from oil and gas operations in Osage County and other areas.

My report could not find a clear line of responsibility in dealing with permits, surface use, assurances that proper well construction practices are followed, safety practices were followed, overall environmental protection, air emissions, surface and ground water use and protection, wildlife habitat, and well data.

I pointed out to BIA at our January 17th meeting the need to address changes to the CFR which has "created" a Conflict of Interest issue:

An example: As a result of the BP Gulf of Mexico incident changes were made by the DOI to the Minerals Management Service. They formed BSEE and BOEM so that the regulatory body and the minerals collection functions are 2 separate agencies (like in most states). States and now the Department of Interior have two separate and distinct organizations leasing and collecting royalties and another regulating and enforcing regulations. The conflicting incentives for one agency responsible for royalty generation and enforcing regulations was by itself a conflict of interest. The DOI developed stronger testing, regulations and requirements, better trained operators and regulators who have no personal conflicts of interest. This has improved safety and environmental protection. *Does BIA want to wait for a blowout and/or death to make these needed changes?*

I recommend a new section for defining regulatory authority and responsibilities: the revised CRF should clearly state who is responsible and accountable for proposed and issued permits, notifications, oversight of well construction, site planning and construction, emissions, sourcing water for use in well operations including re-use and disposal, surface water protection, protecting ground water, wildlife, safety, produced water UIC, pipelines and water and oil spills. There should also be a process to list violators, and what action was taken for the violation. This process all needs to be transparent; posted and updated on the web site, with phone numbers, emergency numbers made available to everyone.

The permit and plugging bonds are inadequate and the sections addressing bonds for well permits need to be revised up to current standards. This section is well below all other State and Federal standards. If unchanged these very low bond requirements will continue to cause more orphaned and abandoned wells and more problems down the road.

You have no doubt seen photos from landowners of poor practices and the lack of enforcement. My report lists these documents problems caused from outdated and inadequate rules, lax regulatory oversight which is compounded by "turf" issues. There is poor communication and cooperation between BIA, Osage Minerals Council and landowners which needs to be changed. The January 17th meeting we had with the BIA and the Mineral Council was a good first start.

Your goal for this CFR process should be to get regulatory standards up to the standards of most states and the BLM. Osage County has the most lax regulations and as a result, the poorest practices in the US if not in the all the Americas. During my career I have never witnessed anything any worse.

A reform process needs to incorporate experts:

- Work with and get assistance from the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife, Occupational Safety and Health Administration, the US Geological Survey (particularly in defining proper casing depths), Bureau of Land Management and ***especially*** the State of OK regulatory authorities the OK Corporation Commission, OK Department of Environmental Quality and more involvement with the OERB.
- Work with operators to address the near term issues before a serious incident happens. The legitimate operators will embrace this process.
- Get input from the experts who have done this before.
- Include stakeholders, the community and first responders in your process.
- Create a properly staffed, well-trained transparent organization structure which will objectively improve environmental stewardship and safety while attracting prudent operators to Osage County.

ATTACHMENT 1

The Environmentally Friendly Drilling (EFD) program, managed by the Houston Advanced Research Center (HARC), ***provides unbiased science and develops solutions to address environmental and societal issues associated with oil and gas development.*** Featuring an international research team, the program has had many accomplishments. The accomplishments are rather remarkable in that the program has successfully brought together government agencies and regulators, industry, academia, environmental organizations, a variety of associations and the public. As ***RigZone*** reported:

> ***"No other organization in the oil and gas area has ever been able to successfully link this broad spectrum of stakeholders, providing opportunities for communication between groups that normally do not communicate very well."***

A testament to the program's success is the number of speaking invitations and the large number of publications in a broad variety of media. Engaging sponsors and all stakeholders, the EFD team has accomplished it all by being objective and using sound science in supporting practical practices to reach our goals.

One of the many accomplishments of the EFD program has been to develop a Scorecard. The EFD Scorecard has been developed to measure the tradeoffs associated with drilling in environmentally sensitive areas. It assesses operational impact on air, water, site, waste management, biodiversity and societal issues. The methodology was developed through a series of workshops held with ecologists, botanists, wildlife management experts and others in addition to oil and gas industry experts.

The EFD Team believes that a dialog with the public is crucial. Every August since 2001, the Gallup Organization has polled Americans on their views of more than 20 business and industry sectors in the country. The oil and gas industry has been perceived as one of the least respected businesses, despite providing both affordable energy and jobs for millions of citizens. In order to improve our research and technology transfer efforts, a team, led by Dr. Gene Theodori of Sam Houston State University, has studied stakeholders' perceptions in the Uintah, the Barnett and the Marcellus and found in all cases that the greater the dialog between the community and the O&G industry, the better the relations have been between the two. Where industry has taken the lead in steps to reduce the environmental impact of its operations, the better it is perceived to be a good neighbor. The team had developed an effective communication effort to inform and engage all stakeholders through articles, papers, presentations, website, newsletter, conferences, workshops, and meetings.

Key leaders in the EFD program include:

Dr. Richard Haut is currently a Senior Research Scientist at the Houston Advanced Research Center (HARC) where he serves as the program manager for the energy and environmental projects. A major effort is serving as Principal Investigator (P.I.) for the Environmentally Friendly Drilling program in partnership with Texas A&M University, other universities, industry and environmental organizations with the objective of integrating advanced technologies into systems that address environmental issues associated with petroleum drilling and production. The effort was recognized by the Interstate Oil and Gas Compact Commission, receiving their Chairman's Environmental Partnership award in 2009. Dr. Haut also is the P.I. of the Coastal Impacts Technology Program (CITP) aimed at addressing environmental issues associated with energy production along the Texas gulf coast.

Dr. Haut's technical background includes a Masters degree and a Ph.D. in Engineering. He has over 25 years of industry technical and management experience prior to joining HARC in June 2002, having been responsible for analyzing offerings for key technologies or niche capabilities and developing synergistic, strategic relationships in the energy industry. He also was instrumental in establishing joint ventures and other joint industry programs, including the start-up of Enventure Global Technology where he was the Chief Operating Officer. In 1999 he received Hart Publication's Meritorious Award for Engineering Innovation and in 2002 received the Natural Gas Innovator of the Year Award from the Department of Energy. Dr. Haut's career includes a ten year time period where he was assigned to North Sea operations as a well technology manager and advisor for drilling and completion operations in both Norway and Scotland.

Dr. Haut has been invited to speak at various conferences, has authored numerous papers, has been awarded over three dozen patents and has several patents pending. He has also been requested to participate in Congressional hearings and briefings. He was featured in the ***Wall Street Journal***, February 11, 2008 as well as the Summer 2008 edition of ***Echoes***, the alumni magazine of Rose-Hulman Institute of Technology and has been interviewed on multiple occasions by the media. He has frequently been asked to speak about sustainable development, the built environment and the offshore/energy industry. In addition, he has given testimony to Congress concerning research and technology developments to produce energy in an environmentally sound and safe manner and served on a five member work group to assist the National BP Deepwater Horizon Gulf Spill and Offshore Drilling Commission. He is a board member of the Research Partnership to Secure Energy for America (RPSEA) where he also chairs the Environmental Advisory Group.

Thomas Williams has been in the energy business for over 30 years as an operator and later in his career in the management and commercialization of new energy technologies. He held senior executive positions at the U.S. Departments of Energy, Office of Fossil Energy (DOE) and Department of Interior (DOI) during the Bush Administration from 1989 to 1993 and has continued to be involved in a variety of activities and organizations fostering cooperation between the government and private sector.

At DOE he had primary oversight of the Oil and Gas R&D Program and implemented the first program focused on technology transfer for independent producers; he started DOE's first environmental R&D program and was the official DOE representative for many outside organizations including the IOGCC, GRI and AASG. At DOI he was the Deputy Director and Chief of Staff for the Office of Surface Mining and led a major initiative for the Bush Administration on regulatory review of all Federal regulations of Fossil Fuels.

He was Director and responsible for privatizing a former major oil company upstream research and technology services company in Houston in 1993. The company was sold in 1997 and he has since started and led a number of successful technology companies. As Vice President of Business Development of a leading drilling technology company in 2001, he was instrumental in selling the business to Noble Drilling Corporation.

In 2005 he co-founded the Environmentally Friendly Drilling Project with associates from Texas A&M and HARC; knowing that the effort to identify and develop technologies which would reduce the environmental impact of oil and gas activities must be led by academia. The project has grown with funding from the government and a broad base of industry operator and service companies. The program operates with active participation from over 20 universities, national labs and environmental organizations. He continues to be an active part of the management team of this award winning program.

After he retired from Noble Corporation in 2007, as Vice President, Research and Business Development, he has served on the Board of Directors of Far East Energy Corporation, Petris Technology and Nautilus International. He has also served on the Board of Directors and the Executive Committee of the Research Partnership to Secure Energy for America (RPSEA), co-chairman of the DeepStar consortium contributor's committee which includes over 60 of the leading service providers to the oil and gas industry.

Mr. Williams is well known in the industry and has authored numerous energy publications, presentations and articles and continues to serve on a number of oil and gas organizations, associations, energy advisory boards including the Consumer Energy Alliance, Drilling Engineering Association, IADC, IPAA, Texas Energy Alliance, AADE, SPE and ASME. He learned the oil and gas business from the ground up as a roughneck, land manager, director, president and CEO. He has a business degree from Campbellsville University with continuing education in mineral and property law, the Cambridge school of business management and training/certifications in oil and gas drilling, operations and safety.

Mr. David Burnett is the Director of Technology for the Global Petroleum Research Institute (GPRI) at Texas A&M University and is the Research Project Coordinator for the Department of Petroleum Engineering. He served as the Managing Partner of the U.S. DOE Project DE-FC26-05NT42658 *Field Testing of Environmentally Friendly Drilling Systems* representing a $4 million joint partnership among university/industry and government organizations dedicated to reducing the impact of O&G operations in environmentally sensitive areas. He currently is one of the principals in the RPSEA funded EFD

program focusing on integrating advanced technologies for low impact drilling. In addition through GPRI, he leads a research team developing advanced membrane filtration technology to reduce waste water volumes at rig sites, including flow back fracturing fluids. He received the 2006 Hearst Energy Award for Technology in the oil industry and his research team won Gulf Publishing's 2008 World Oil Awards (environmental, health and safety).

Burnett is currently the Principal Investigator and Project Manager of the research project *Membrane Treatment Options to Allow Re-Use of Frac Flowback and Produced Brine for Gas Shale Resource Development* Project Number DE-FE0000847 funded by the U.S. DOE and the New York State Research Development Authority (NYSERDA).

Under Burnett's direction, Texas A&M University GPRI Team has had numerous successes, including:

1997 First University Program Addressing Barnett Shale Productivity
2001 First Major University Research Program on Treatment of Produced Water
2005 First Functional Membrane Technology for Produced and Frac Flowback Brine
2005 First University Program Addressing Environmental Issues in Oil & Gas Drilling
2007 First EFD "Scorecard" Proposed
2008 "Disappearing Roads" Program
2009 University/National Labs Alliance
2009 Eagle Ford Shale EFD Study
2010 EFD A&M Marcellus Shale Pre-Treatment Field Demos
2010 EFD EU Program Started
2011 Frac Flowback Brine Analytical Technology Partnership

Dr. Gene Theodori is Professor & Chair of Sociology and Director of the Center for Rural Studies at Sam Houston State University. Dr. Theodori earned a Ph.D. in Rural Sociology from The Pennsylvania State University in 1999. He teaches, conducts basic and applied research, and writes professional and popular articles on rural and community development issues, energy and natural resource concerns, and related topics. A central feature of his work is the development of outreach educational and technical assistance programs that address important community-level issues associated with energy development. He has served as President of the Southern Rural Sociological Association (2008-2009) and is currently co-editor of the *Journal of Rural Social Sciences*. He is also a member of the Environmentally Friendly Drilling Systems Program management team. Dr. Theodori received the Excellence in Extension and Public Service Award from the Southern Rural Sociological Association in 2007, the Award for Excellence in Extension and Public Outreach from the Rural Sociological Society in 2010, and the Award for Excellence in Research from the Southern Rural Sociological Association in 2011.

Since accepting his first faculty appointment in 1999, Dr. Theodori has maintained an active inter-disciplinary research and outreach agenda. When conducting research, he commonly utilizes a mixed-methods approach to data collection and analysis. This approach involves the use of both qualitative and quantitative research protocols. His goal as a researcher is to methodically acquire, assess, and transmit robust social-scientific knowledge that addresses timely community development issues and natural resource-related problems to academicians, policymakers, practitioners, and members of the general

public. In short, his philosophical and applied orientation to research involves: (1) the accumulation and use of sociological knowledge to address current community and natural resource-related problems; (2) the assertion that such knowledge must be obtained by empirical research procedures; and (3) the affirmation that this knowledge should be conveyed to stakeholders and the general public with relevant outreach and continuing education programs and services.

Over the past eleven years, Dr. Theodori has been the recipient or co-recipient of approximately $2.0 million in research/scholarly funding from several entities, including the United States Department of Agriculture, the United States Department of Energy, the Rural Sociological Society, the Southern Rural Development Center, the Southeastern Regional Small Public Water Systems Technical Assistance Center, and the Texas Water Development Board. Findings from the studies funded by these entities have been, and continue to be, disseminated in a variety of venues. Included herein are paper presentations at professional meetings and printed materials such as research reports to the sponsoring agency, Cooperative Extension/outreach education fact-sheets, and peer-reviewed journal articles.

ATTACHMENT 2

DRAFT FDF WELLBORE INTEGRITY CRITERIA INTRO

Proper well construction and monitoring is necessary to isolate protected groundwater, conserve oil and gas resources, and protect public safety. According to the American Petroleum Institute (API)), "Maintaining well integrity is a key design principle and a design feature of all oil and gas wells" (API Guidance Document HF-1).

In recent years, numerous states have modernized oil and gas regulations pertaining to well control, construction, integrity monitoring, and hydraulic fracturing stimulation. While upgrading standards within their respective states, Directors have had to wrestle with the questions, "What are the essential elements of an effective regulatory schema, and what standards are necessary for our respective states?" State regulatory standards will never be identical. States must adopt standards within the boundaries of state law, and each state must craft rules that address the unique aspects of geology, hydrogeology, natural resource conservation, drilling practices, petroleum reservoir characteristics, the history of incidents and failures within the state, and state definitions of protected groundwater consistent with state water resource management plans. Although standards will vary, greater consistency in the scope of state regulatory schemas would be beneficial.

The Environmental Defense Fund (EDF) will make available to Osage a first draft outline that proposes a set of elements for consideration in modernizing wellbore integrity rules. The list draws on the API HF-1 (2009), the Groundwater Protection Council's Review of State Regulations Designed to Protect Water Resources (2009), and EDF's collaboration with Southwestern Energy. The draft outline does not propose specific standards, but rather identifies the elements that should be considered to ensure that oil and gas wells are constructed with mechanical integrity, and that mechanical integrity is maintained throughout the full life cycle of the well.

For states and other regulators committed to revising wellbore integrity rules, EDF and Southwestern also developed a "Model Regulatory Framework" (MRF) to serve as a road map for upgrades to regulatory standards for well construction and integrity testing. The MRF is styled in the format of actual regulation and proposes specific standards that reflect the elements identified in the outline.